

Christopher J. D. POMFRETT, *et al.*
Serial No. 10/553,745
July 10, 2008

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Although a box was checked on the office action summary indicating the attachment of Forms PTO/SB/08a or the like associated with IDSs filed April 24, 2006, and October 18, 2005, no such attachments were actually found. However, the undersigned did find such completed forms in the electronic file wrapper, one of which was dated as having been reviewed and initialed on March 28, 2008, while the other included an electronic signature of the Examiner in the "date considered" field. It is now noted that these IDSs were substantial duplicates in any event. However, the Examiner is requested to ensure that the USPTO file is appropriately documented so these references will appear on the face of any issued patent as having been considered.

The specification has been amended above so as to insert appropriate headings in accordance with the Examiner's requirement.

The formality-based objection made to claims 22, 24 and 29 have been obviated by the above amendments. In this regard, it will be noted that claim 22 has been amended so as to more explicitly reflect the original specification teaching (e.g., see page 4, paragraph 4) that the stimulus may occur spontaneously and that such spontaneous occurrence of the stimulus may itself be detected as the application of the stimulus to the nervous system so as to determine when the timed measurements should be taken. Artificial "application" of the stimulus is, therefore, not required.

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If there are any remaining formality-based concerns, the Examiner is respectfully requested to telephone the undersigned for prompt resolution.

In response to the rejection of claims 24, 25 and 33 under 35 U.S.C. §112, second paragraph, these claims have been amended so as to remove the stated bases for rejection of each such claim.

In response to the rejection of claim 39 under 35 U.S.C. §101, claim 39 has been amended so as to make it clear that it does not include electromagnetic carrier signals.

Accordingly, all outstanding formality issues are now believed to have been resolved in the applicants' favor.

The rejection of claims 22-26, 28-31, 36 and 38-40 under 35 U.S.C. §103 as allegedly being made "obvious" based on Yamazaki '825 in view of John '335 is respectfully traversed.

Claim 22 is directed to a method for monitoring the response of a body's nervous system to a stimulus. The method comprises, after application of a stimulus, collecting a set of voltage measurements between selected areas on a surface of the body while current is passed between selected regions on the surface of the body. The set of voltage measurements is collected over a predetermined measurement period, initiated a predetermined time after application of the stimulus, and the collected voltage measurements are compared with reference measurements to determine normal or abnormal response of the nervous system. The applicants have realized that, by

beginning the predetermined measurement period a predetermined time after application of the stimulus, the data obtained can be analyzed to determine which parts of the brain are active at a particular time after a stimulus has been applied. The applicants have realized that this enables them to determine if a particular part of the brain is responsive to the stimulus.

Yamazaki is directed to an evoked potential measuring apparatus in which an evoked potential, which reflects a variation in internal condition of a human being, can be measured (Abstract). Yamazaki includes a sensory stimulus application means and means for measuring and amplifying a brain potential evoked in response to the sensory stimulus. The apparatus of Yamazaki further comprises means for controlling recording of brain signals from the measurement means and means for measuring a physiological measure to be used for estimation of an internal condition of the subject, together with means for controlling recordation of a physiological measure output from the measurement means (2:49-67). The apparatus further comprises means for performing calculations on the evoked brain potential and physiological measure (3:21-30).

The Examiner asserts that Yamazaki (6:55 – 7:10) discloses the feature of claim 22 requiring that current is passed between selected regions of the surface of the body. This is incorrect.

Yamazaki is directed to measuring an evoked potential, that is, an electrical potential evoked by the stimulus is recorded using, for example, EEG. Such evoked

potentials are low amplitude, passive signals, and to resolve these low-amplitude signals against the background of on-going EEG and other biological signals and ambient noise, signal averaging is usually required. 6:55 – 7:10 describes applying electrodes to measure evoked potential, but there is nothing there to teach (or suggest) that current is actively caused to pass between selected regions of the surface of the body.

The Examiner asserts that Yamazaki (6:45-50 and 7:20-25) discloses the feature of claim 22 requiring that the predetermined measurement period is initiated a predetermined time after application of the stimulus. This is again incorrect.

Col. 7, lines 20-25, referring to Fig. 5, describe that each time light is emitted from the flash apparatus, a signal of the evoked brain potential is recorded for a preset time. Yamazaki goes on to explain that after each lapse of the preset time interval, a next emission of light is attempted (7:35-37). It can be seen from Fig. 5 of Yamazaki that the evoked brain potential data is measured continuously, as indicated by the continuous line marked "brain potential data."

It is clear from Fig. 5 of Yamazaki and the description at col. 7 that evoked brain potential is measured continuously, and light is emitted at intervals during the period of measurement of evoked brain potential data. This is further demonstrated in Figs. 3 and 4, which show brain potential data being measured continuously from before the stimulus application, which is indicated by the rectangular waveform at the lower stage of Figs. 3 and 4 (8:39-41). It is clear, therefore, that there is nothing in Yamazaki at

col. 7 to teach or suggest that the predetermined measurement period is initiated a predetermined time after application of a stimulus.

Yamazaki describes at col. 6 an interval of time after which the flash apparatus is to be energized to emit light (lines 43-44), a period of time for which the brain potential is to be measured (lines 45-46), and a period of time for which the physiological measure is to be measured (lines 49-50). This is not a predetermined measurement period initiated a predetermined time after application of a stimulus.

Furthermore, Yamazaki is directed to measuring evoked potentials when a stimulus is applied a large number of times (6:28-33). This is fundamentally different from the claimed set of voltage measurements as described in the present application, which are collected in response to a single corresponding stimulus.

The Examiner argues that it would have been obvious to a person of ordinary skill in the art to modify the method of Yamazaki to include features of John to arrive at the invention of claim 22.

However, there is nothing Yamazaki or John to teach or suggest the applicants' claimed features that (a) current is passed between selected regions of the surface of the body, or (b) the predetermined measurement period is initiated a predetermined time after application of the stimulus. By obtaining a complete set of voltage measurements, an image of the impedance distribution in the brain can be created using known image reconstruction algorithms. As indicated above, the applicants have

realized that, by beginning the predetermined measurement period a predetermined time after application of a stimulus, the obtained data set can be analyzed to determine which parts of the brain are active at different times after a stimulus is applied and this enables one to determine if a particular part of the brain is responsive to a particular stimulus.

Independent claims 36 and 38 also require passing current between selected regions of a body surface and collecting a set of voltage measurements over a predetermined measurement period, which is initiated a predetermined time after application of a stimulus. Accordingly, the cited Yamazaki and John references suffer the same deficiencies as already discussed for these independent claims, as well as claim 22.

Given such fundamental deficiencies of the cited references with respect to the above-discussed features of the independent claims, it is not believed necessary at this time to discuss additional deficiencies of this allegedly “obvious” combination of references with respect to other features of the rejected claims.

The rejection of claim 27 under 35 U.S.C. §103 as allegedly being made “obvious” based on Yamazaki/John in further view of Vauhkonen is also respectfully traversed.

Of course, the applicants have never claimed to be the inventors of a Kalman filter. However, Vauhkonen does not teach or suggest using such filter in the claimed

context. That is, Vauhkonen does not supply the above-noted fundamental deficiencies of parent claim 22.

The rejection of claims 32, 34 and 37 as allegedly being made "obvious" based on Yamazaki in view of Polydorides is also respectfully traversed.

Claim 32 as amended is directed to a method for monitoring the response of a predetermined part of a nervous system of a body to an applied stimulus. The method comprises identifying the predetermined part of the nervous system. A current is passed between selected regions of a surface of the body and a set of voltage measurements between selected areas on the surface of the body are selected while current is being so passed. The collecting is initiated a predetermined time after application of the stimulus, the predetermined time being selected on the basis of a neurological model of the nervous system and the predetermined part of the nervous system for which a response is monitored.

As explained above, Yamazaki does not teach or suggest the applicants' claimed feature that collecting is initiated a predetermined time after application of the stimulus. There is also nothing in Polydorides to teach or suggest this feature. Furthermore, there is nothing in Yamazaki or Polydorides to teach or suggest a predetermined time after which measurements should begin, selected on the basis of a neurological model of the nervous system and the predetermined part of the nervous system for which a response is monitored. From neurological models, it can be determined which part of the brain would be active at a predetermined time after application of the stimulus. The

applicants have realized that, by beginning the predetermined measurement period a predetermined time after application of the stimulus, the image can be analyzed to determine whether the expected part of the brain is active. The applicants have realized that this enables one to determine if a particular, expected part of the brain is responsive to a stimulus.

Independent apparatus claim 37 is also patentably distinct from any teaching or suggestion of Yamazaki/Polydorides for reasons already noted with respect to method claim 32.

Accordingly, it is not believed necessary at this time to explain further deficiencies of this allegedly "obvious" combination of references with respect to other features of the rejected claims.

The rejection of claims 33 and 35 under 35 U.S.C. §103 as allegedly being made "obvious" based on Yamazaki/Polydorides in further view of John is also respectfully traversed.

Fundamental deficiencies of all of these references have already been noted above, which are applicable to parent claim 32. That is, even if the complete combination now alleged by the Examiner to be "obvious" is assumed *arguendo* to be so, that would still not provide the claimed invention.

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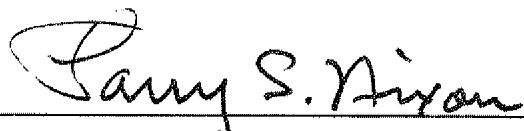
Accordingly, it is not believed necessary at this time to discuss the additional deficiencies of this allegedly "obvious" three-way combination of references with respect to other features of the rejected claims.

The Examiner's attention is also directed to new claims 41 and 42. Both of these method claims require, *inter alia*, collecting a set of voltage measurements between selected areas on the surface of a body while current is passed between selected regions of the body surface – and wherein the set of voltage measurements is collected over a predetermined measurement period which is initiated a predetermined time after application of the stimulus, etc. Accordingly, these claims are also believed to be patentably distinct from any teaching or suggestion of the cited references.

Accordingly, this entire application is now believed to be in condition for allowance, and a formal notice to that effect is respectfully solicited.

Respectfully submitted,

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